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BACKGROUND OF THE INVENTION

Circuit arrangement for integration of EDP systems in the utilization of telephone systems

The invention concerns a circuit arrangement for the integration of EDP systems in the utilization of telephone systems connected to the public telephone network ISDN or Euro ISDN.

With the development of data acquisition, processing, evaluation and last but not least its application, the necessary communication requirements increased. There is now an urgent need to find economical solutions which incorporate new ways of integrating speech and data communications systems.

Until today only partial and isolated solutions could be produced satisfactorily for PC-TC links. Present speech and data communications systems are characterized mainly by manual activities and voice communication which are time-consuming and subject to a high loss rate. It is therefore common practice today for speech and data communications to take place in such a way that the caller determines the competent party by telephone, that they then exchange data and information necessary for mutual identification and which form the basis for the subsequently desired voice and data communications of the caller.

The competent party for the call acquires the data and information desired by the caller from his computer or stores additional data and information of the caller in it. If other data and information is then required which the competent party does not have at his disposal, the responsible person must be included as a further competent party in this speech and data communication in the same way as described above. The disadvantage of this speech and data communication is that it is too time-consuming, that incomplete and false information may be transferred due to the speech communication and manual operation of the computer. In addition no data-controlled connection setup is possible with

- * the switching functions
- * connect
- * transcouple
- * release
- * activation of refer-back
- * logon
- * the monitoring system
- * inquiry of the connection status
- * disconnect
- * transfer
- * brokerage
- * initiation of multiparty conference
- * determination of the party status
- * the control function for the features

Simultaneous Fax
* parallel or simultaneous fax transmissions and data transfer with ongoing speech and data communication *with ongoing*

A telephone data service with respect to the control of digital telephone extensions with data entry via a telecommunications and information system and identification of the caller via ISDN or Euro ISDN in the present ITR6 protocol or the future EDSS1 protocol cannot be protected. Other disadvantages are that data and information which may be available in part in large volumes cannot be transferred mutually in this speech and data communication. This is done subsequently by mailing or by fax. This means even more time is lost and a delay in urgent decision making. Furthermore solutions are known which allow a partly rational speech and data communication by using (special) high-performance telephone extensions. Every telephone extension is connected to only one computer by an expensive circuit card which operates with a specially developed software. Such a solution brings further disadvantages in addition to the high costs. The disadvantages are the impossibility of setting up multiparty conferences especially for data transmission. A direct data transfer from the competent party to the caller and vice versa and the control of digital telephone extensions with data entry via a telecommunications and information system and the identification of the caller by ISDN or Euro ISDN in the present ITR6 protocol or the future EDSS1 protocol is only possible with a telephone extension and the respective connected computer.

According to DE-QS 4101885 a telecommunications system, a telephone system to be precise, is known which possesses a switching system with terminals and which is connected to a computer for simplified or additional handling of computer-aided communication services. It is distinguished by the fact that the computer is an integral part of the telecommunications system and has an interface which is available not for telecommunications services but for external computer services. This solution also has disadvantages in that all functions of a TC system cannot be used and operated by every computer in the network so that not every type of communication can be generated by all computers in the network (speech and data communication and image transfer).

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~~This problem is solved by the invention with the features specified in patent claim 1. Preferred further developments of the invention are given by the sub-claims.~~

Sub B1
The advantages of the invention are that a telephone system can be linked to an EDP system in such a way that all functions of the EDP system can be used during utilization of the telephone system.

It guarantees a data-controlled connection setup with

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- * logon
- * the monitoring system
- * inquiry of the connection status
- * determination of the party status
- * the control function for the features
- * parallel or simultaneous fax transmissions and data transfer with ongoing speech and data communication

Other advantages of the invention are the control of digital telephone extensions with data entry via a telecommunications and information system and identification of the caller by ISDN or Euro ISDN in the present ITR6 protocol or the future EDSS1 protocol. If the LAN should fail, the speech communication can be maintained. Simple telephone extensions without multi-functions are required to operate this speech and data communication system.

insert B2
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~~The invention is explained below in figure 1.~~ In order to satisfy the increasing communications requirements, it is necessary to design speech and data communications systems more economically and here the most acute need is for an integration system.

The circuit arrangement for the integration of EDP systems in the utilization of telephone systems illustrated in figure 1 is shown by way of explanation on an intelligent telephone system which is connected to the public ISDN or Euro ISDN telephone network externally and internally both via the LAN with three personal computers and with three telephone extensions. However, it should be emphasized that this circuit arrangement can also be used for analog telephone systems with a specially developed software.

When a caller dials a competent party of telephone extension 2 through the public ISDN or Euro ISDN telephone network and the connection is established, the connection is made directly through an intelligent telephone system 3 and a line a to telephone extension 2. At the same time the personal computer 4 assigned to telephone extension 2 establishes a connection with the intelligent telephone system 3 via a line b, an integration element 5 comprising a computing system 6, a software 7 and an SDLC or ISDN connection element 8 with an internal software, a line c, a LAN 9 including the LAN server 10 by means of line d and a line e. With this connection every dialling function is established, the incoming call is identified and all the necessary data are displayed on the personal computer 4. This is realized by the integration element 5 in such a way that when a call is connected to telephone extension 2 a signal is immediately sent on line b by the intelligent telephone system 3 to the integration element 5, which, assigned the appropriate information in a data record by the integration element 5, is passed via the LAN 9 to the associated personal computer 4. Here it is possible to pass the caller data and information directly from the LAN server 10 and its database at the same time as the call arrives. If the party dialled by the caller with telephone extension 2 is not the competent party then the caller can call the competent party, e.g. extension 11 by operating the keyboard of his personal computer 4 and by switching a data record via line c, the LAN 9 via line c to the integration element 5 by the signal generated by the integration element 5, via line b to the intelligent telephone system 3 and from there via the line a. Here too, all the

necessary data are displayed immediately after the connection has been made on his personal computer 12, released by signals of the intelligent telephone system 3 which is converted into a data record in the integration element 5 and was sent via LAN 9 with inclusion of the database of the LAN server 10 and the associated lines c; d; e to the personal computer 12 and the necessary communication can take place immediately. If the called or switched competent party, e.g. at extension 11, requires the inclusion of another competent party or several competent parties to clarify questions and data of the caller, he can include these competent parties in a conference by operating the keyboard of his own personal computer 12 and by transferring a data record in the same way as described above via the intelligent telephone system 3 by establishing the connection so that all telephone extensions 2; 11; 13; and personal computers 4; 12; 14 are connected. Whereby all those participating in the conference can transfer data and information to the caller and from the caller to all other participants in the conference. Exchange of data between the competent parties is also possible irrespective of whether a caller is included in the speech and data communication or not.

Parallel to the above mentioned voice and data communication it is possible for every competent party to send the caller a fax.

This simultaneous and parallel fax transmissions next to the ongoing speech and data communication via the connection of the respective personal computer 4, 12 or 14 is made simultaneously via the line e with the LAN 9 with inclusion of the LAN server 10 via the line d, via the line c with the integration element 5 comprising the computing system 6, the software 7 and the SDLC or ISDN connection element 8 with an internal software and via the line b with the intelligent telephone system 3 to the public ISDN or Euro ISDN telephone network and thus to the caller by operating the keyboard of the personal computer 4; 12 or 14.

Insert B3

References Used

- 1 Public telephone network ISDN or Euro ISDN
- 2 Telephone extension for personal computer 4
- 3 Intelligent telephone system
- 4 Personal computer for telephone extension 2
- 5 Integration element
- 6 Computing system
- 7 Software layer
- 8 SDLC or ISDN connection element
- 9 LAN
- 10 LAN server
- 11 Telephone extension for personal computer 12
- 12 Personal computer for telephone extension 11
- 13 Telephone extension for personal computer 14
- 14 Personal computer for telephone extension 13

a; b; c; d Lines